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Low-temperature peculiarities of AlGa_N/Ga_N heterostructure transport.¹ ANDRIY KURAKIN, SVETLANA VITUSEVICH, SERHIY DANYLYUK, NORBERT KLEIN, Forschungszentrum Juelich, ISG 2, Germany, ALEXANDER BELYAEV, Institute of semiconductor physics, Kiev, Ukraine — At present, AlGa_N/Ga_N heterostructures are attracting a lot of scientific interest in semiconductor research and are extensively studied. Despite this there are a number of open questions concerning the low temperature properties of such systems with two-dimensional electron gas (2DEG). We report here our recent results on transmission-line model (TLM) patterns and high electron mobility transistor (HEMT) measurements in the temperature range of 0.3-10.0 K. A set of samples with different Al fractions of the barrier layer, wide bandgap spacer and different substrates were tested. It is important that accurate information on 2DEG systems becomes available with the systematic analysis of current-voltage characteristics of TLM patterns. The latter enables channel resistance to be extracted from total device resistance. It was found that channel conductance in low electric field shows metal-like temperature dependence. The peculiarities observed in low-temperature characteristics of AlGa_N/Ga_N heterostructures are analyzed.

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